



**STRATEGY
RESEARCH
PROJECT**

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

INFORMATION TECHNOLOGY STRATEGY DEVELOPMENT

BY

LIEUTENANT COLONEL ROBERT L. JASSEY
United States Army

DISTRIBUTION STATEMENT A:
Approved for Public Release.
Distribution is Unlimited.

USAWC CLASS OF 2001



U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050

20010430 122

USAWC STRATEGY RESEARCH PROJECT

Information Technology Strategy Development

by

LTC Robert L. Jassey
U.S. Army

COL Ralph Ghent
Project Advisor

The views expressed in this academic research paper are those of the author and do not necessarily reflect the official policy or position of the U.S. Government, the Department of Defense, or any of its agencies.

DISTRIBUTION STATEMENT A:
Approved for public release.
Distribution is unlimited.

U.S. Army War College
CARLISLE BARRACKS, PENNSYLVANIA 17013

ABSTRACT

AUTHOR: LTC Robert L. Jassey
TITLE: Information Technology Strategy Development
FORMAT: Strategy Research Project
DATE: 10 April 2001 PAGES: 43 CLASSIFICATION: Unclassified

Technology is doubling every eighteen months. Trends indicate that this rate of increase will itself increase. The information explosion has engulfed everyone. The Army is no exception, with its digitization efforts and its focus on information dominance in the future. However, soldiers serving in Army units quickly realize that in our rush to the future, we may be forsaking the present. Building, resourcing, and evaluating an Information Technology (IT) strategy that can stand the test of time is problematic at best. The Army must fight for a budget each year with no assurance of how much money, if any, will be available for long-term IT investment projects. The essence of strategy is to build a posture that is so strong (and potentially flexible) in selective ways that the organization can achieve its goals despite the unforeseeable ways external forces may actually interact when the time comes. Corporate America endures many of the same challenges as the Army. Close analysis of how Corporate America is meeting the challenges of developing, resourcing, and evaluating a business enterprise strategy could well benefit the Army. This study explores the Army's IT strategy development process, comparing it with a corporate strategy development process. It concludes with recommendations for enhancing the Army's IT strategy development process.

TABLE OF CONTENTS

ABSTRACT.....	iii
PREFACE	vii
LIST OF ILLUSTRATIONS.....	ix
INFORMATION TECHNOLOGY STRATEGY DEVELOPMENT	1
STUDY METHODOLOGY.....	2
THE 5 P'S OF STRATEGY	3
GENESIS OF THIS STUDY	4
STRATEGIES ARE NOT JUST FOR WINNING WARS	4
IMPLICIT VERSUS EXPLICIT STRATEGY DEVELOPMENT	5
THE ARMY ENTERPRISE STRATEGY.....	5
THE FOUNDATIONAL TENETS OF THE ARMY ENTERPRISE STRATEGY.....	6
THREE CASE STUDIES.....	9
ARMY IT STRATEGY DEVELOPMENT	13
BASIC STEPS OF ARMY IT STRATEGY DEVELOPMENT	14
STEP 1: GAP ANALYSIS AND SOLUTION DEVELOPMENT	15
STEP 2: STRATEGY FORMULATION	16
STEP 3: IMPLEMENTATION.....	16
C4I/IT INVESTMENT STRATEGY CHARTER.....	17
BUSINESS IT STRATEGY DEVELOPMENT.....	17
BASIC DIMENSIONS OF STRATEGY	18
DEVELOPING STRATEGY UNDER UNCERTAINTY.....	18
CENTRALIZED VERSUS DECENTRALIZED.....	20
BUSINESS STRATEGY DEVELOPMENT PROCESS	20
PROCESS ANALYSIS.....	23
SIMILARITIES	23

DIFFERENCES.....	24
REFLECTIONS AND CONCLUSIONS	26
ENDNOTES	29
BIBLIOGRAPHY	33

PREFACE

I would like to thank COL Ghent, my project advisor, for helping one locate more resources when they started to thin out and for taking the time to help me think through what I wanted to communicate.

I would like to thank my wife, Tami, for diligently editing and giving me constructive feedback.

I would also like to thank Dr. Jim Hahn for the tremendous review of this SRP. His suggestions were very valuable to me.

LIST OF ILLUSTRATIONS

FIGURE 1 STRATEGIC FRAMEWORK.....	13
FIGURE 2 INVESTMENT STRATEGY PROCESS	14
FIGURE 3 IDENTIFICATION OF SIGNIFICANT SHORTFALLS (X=GAPS).....	15
FIGURE 4 GAP ASSESSMENTS AND SOLUTION DEVELOPMENT	16

INFORMATION TECHNOLOGY STRATEGY DEVELOPMENT

*In our rush to the future
Are we forsaking the present?*

The Army will not realize its Information Technology (IT) strategy end state without changing how it develops, resources, and evaluates that strategy. There is clearly a need for change in the Army IT strategy development process. This challenge is not unique to the Army. Indeed, practices currently in use in the commercial world can assist the Army in developing a viable IT strategy.

Everyone seems to be in a mad dash to have the latest and greatest gadget. Within ten years we may see computers that have the equivalent processing power of the human brain.¹ Large corporate enterprises, to include the Army, are caught in the throes of this technological tidal wave, fighting desperately to avoid being capsized. With each new leap in technology, the potential exists for a competitor — whether economic, political, or military — to seize the initiative and pose a significant threat. Positioning an enterprise to be a leader ten, twenty, or more years from now using technology that may not even exist today will not happen by accident. Such forward thinking and planning will require leadership, vision, and a strategy that takes advantage of a future that cannot be defined with certainty.

The Army, not unlike many enterprises in America, finds itself in the position of balancing the desire to capitalize on the most current technology, getting the most from each dollar that is spent from a limited, somewhat unpredictable IT budget, using an acquisition process that is very cumbersome. The Army is steeped in a tradition of building successful strategies to fight and win wars. Thus it assumes the same processes to build military strategy ought to be useful in building successful IT strategies to support the Army's future vision. For years the Army laid requirements on the acquisition community to buy and build equipment that could stand extremely harsh, unusual conditions. The costs of those special requirements were spiraled orders of magnitude greater than similar equipment bought for commercial use. It took the acquisition community so long to build that the acquired technology was already antiquated when fielded. Many of those special requirements were based on unique Army needs for reliable, mobile, secure, and durable IT tools, able to withstand the most inhospitable conditions.

During the past decade, commercial firms have also generated a demand for reliable, mobile, secure and durable IT tools. Companies no longer confine their business to an office. Now they are taking their management, communications, training, marketing, and other programs to all parts of the world, to be used in all kinds of physical and organizational

situations. Every day commercial enterprises are competing for market share, striving to be the first to open a new market. The winners continue, keeping a close eye on future competitive threats — while the losers often simply go away. The commercial world has, as a matter of survival, had to devise IT strategies that give them the greatest competitive edge for the fewest amount of dollars. So, commercial enterprise requirements have become very similar to Army requirements.

STUDY METHODOLOGY

This study will examine the Army's IT strategy development process in light of the process used in the business world. Although corporate America may not have as great a need for equipment that is electro-magnetic pulse proof, many commercial specifications are converging on traditional Army specifications. In some cases the Army spends three to five times the amount of money a corporation does on the same piece of equipment to ensure it meets military specifications (MilSpec).² It is more cost effective to buy commercial off-the-shelf hardware and replace it when it breaks, upgrading to the current level of technology at the same time.

The Army Enterprise Strategy (1993) sets forth the Army's IT strategy. It will serve as our benchmark to measure the extent to which we have attained the strategy's stated end states. However, the Army has adopted a new process to develop an IT strategy and has used it over the past two years in developing what it calls its Command, Control, Communications, Computers and Intelligence (C4I)/IT Investment Strategy. This document now effectively states the Army's IT strategy, although the 1993 Army Enterprise Strategy is currently being updated. The C4I/IT Investment strategy reflects the Army's current level of thinking on how to develop, resource, and evaluate an IT Strategy. The major difference between the two documents is scope. The Army Enterprise Strategy offers a grand vision of the future, whereas the C4I/IT Investment strategy more precisely identifies how to allocate resources over the next six years. Since the 1993 Army Enterprise Strategy makes no statement about resource allocation, the C4I/IT Investment Strategy has become, by default, the Army's IT Strategy. The process that was used to develop the Army Enterprise Strategy is not available for review, only the product. This study will determine whether the Army has learned anything from the successes and failures of the 1993 Enterprise Strategy in developing the C4I/IT Investment Strategy.

A literature review reveals the current school of thought in the commercial world on the importance of developing an IT strategy and offers advice on how to go about building one. One thing is certain: Corporate America has not cornered the market on how to build an IT strategy, no more than the Army has. There are companies who have built and implemented

successful strategies, but there are just as many, if not many more, who have not built an IT strategy. They have paid the price in wasted resources.

THE 5 P'S OF STRATEGY

We should consider the different ways in which the word strategy has long been used implicitly, even if it has traditionally been defined in only one way. Accordingly, five definitions of strategy (strategy as a plan, ploy, pattern, position, and perspective) enable us to appreciate the complexity of IT strategy development. **Strategy as a plan** suggests some sort of consciously intended course of action, a guideline (or set of guidelines) to deal with a situation. For example: A corporation has a strategy to take over a market. **Strategy as a ploy** refers simply to a specific maneuver intended to outwit an opponent or competitor. For example: The US created ambiguity in Sadaam Hussein's mind threatening to use nuclear weapons if he used chemical weapons on our soldiers. Statements since the war indicate nuclear weapons were not targeted. The threat of the use of nuclear weapons, at the time, was the strategy.³

Strategy as a pattern refers to recurrences in a stream of actions that reveals a predictability in consistency of behavior, whether or not intended. Consider this quote from a business executive: "Gradually the successful approaches merge into a pattern of action that becomes our strategy. We certainly don't have an overall strategy on this."⁴ **Strategy as a position** refers to the practice of locating an organization in what organizational theorists like to call an "environment." While position can always be defined with respect to a single competitor, it can also be considered with respect to a number of competitors with respect to markets. Thus we can move from a definition employed by General Ulysses Grant, "Strategy [is] the deployment of one's resources in a manner which is most likely to defeat the enemy", to that of Professor Richard Rumelt in the 1980s, "Strategy is creating situations for economic rents and finding ways to sustain them,"⁵ that is, any viable position, whether or not directly competitive. Finally, **strategy as a perspective** refers to an institutionally ingrained way of perceiving the world. For example, there are organizations that favor marketing and build a whole ideology and organizational strategy around it, like Hewlett-Packard and the "H-P way."⁶

It is important to recognize the subtle, but discrete differences in the way people use the term strategy. For our purposes, strategy will be viewed as:

The skillful formulation, coordination, and application of ends (objectives), ways (courses of action), and means (supporting resources) to promote and defend the interests of the [organization].⁷

Keeping this definition in mind and recalling the implicit ways people use strategy, we can now move forward in discussing why I believe there is a problem with the Army's IT strategy.

GENESIS OF THIS STUDY

STRATEGIES ARE NOT JUST FOR WINNING WARS

Over the last several years, the U.S. military has embraced the potential benefits in the growth in Information Technology. Force XXI, numerous Advanced Warfighting Experiments, Advanced Concept Demonstrations, and other similar activities have riddled our schedules, promulgating hopes of finding and demonstrating the most efficient and effective way to maximize uses of IT. I have been involved in many of the aforementioned projects and have built a digitized Battalion level, Brigade level, and Division level tactical operations center (TOC). Through those experiences, I have wrestled with, and assessed, many of the challenges the Army faces in the area of IT.

Billions of dollars are spent, and will continue to be spent (\$23.2 Billion over the next FYDP for the Army⁸) on IT. Such magnitude of investment demands a strategy that will ensure that the Army's return on the dollars spent is maximized. That magnitude of investment thus demands a strategy that is developed specifically — and explicitly — to meet the vision of the future Army. If funding decisions are not consistent with The Army Plan (TAP), there is no chance of making optimal IT investments.

Essentially strategy enables us to build a posture that is so strong (and potentially flexible) that the organization can achieve its goals despite unforeseeable circumstances.⁹ The Army takes from five to fifteen years to develop and field systems. This lengthy acquisition cycle is not confined to hardware purchases. I was using the Army's prototype Combat Service Support Control System Software (CSSCS) in the Brigade TOC I built in 1995: That software is still not ready for fielding. With technology doubling every 18 months, it is hard to imagine CSSCS acquired "the Army way" is anywhere near "state-of-the-art" when it is finally fielded. How then does an organization as large as the Army develop a successful strategy, flexible enough to take advantage of rapid advances in technology, while constrained to use an acquisition process that is cumbersome and slow — all the while basing the strategy on resources (i.e., a budget) that can change every year? The following review of the Army Enterprise Strategy reveals that the answer to this perplexing question is: Not very well!

IMPLICIT VERSUS EXPLICIT STRATEGY DEVELOPMENT

The Army Staff would certainly claim that the Army's IT strategy is being developed explicitly rather than implicitly. Getting approval to spend billions does require some rationale and justification. Acquisition rationale not only provides access to funding, it also enhances prioritization against all the other programs that seek the same limited dollars. However, we may build the grandest of strategies — but if it is not understood by the organization and properly executed, it becomes irrelevant. Such has been the case with the Army's IT strategy.

Left to their own devices, organizations within the Army are relying on their own professional orientations to address IT needs.¹⁰ It used to be that a soldier coming into the Army would be exposed to technologies beyond that which he had previously experienced. Today, that is no longer true, especially in the area of IT. Young people entering the Army today often have better mobile communication capabilities and computer processing power in their own home than they find in their new Army unit. While the Army has taken too long in developing software to manage training, these young soldiers have already accomplished the same thing in a spreadsheet or a database on their personal computer. Some units take their unit credit card and go to their local computer store to buy what they need. Throughout the Army, ingenious soldiers are developing creative solutions for a variety of purposes. In effect, they are creating and executing their own IT strategies.

Unfortunately, the sum of these creative approaches does not produce the best strategy for the Army as a whole. Well intending, yet ill-informed, soldiers have wasted many dollars and duplicated enumerable efforts because, from their viewpoint, they are the only person willing to solve their problems. This reality leads me to conclude that the Army's IT strategy is not being developed explicitly; rather it is being developed implicitly.

THE ARMY ENTERPRISE STRATEGY

The Army's current IT strategy is embedded in a document called the Army Enterprise Strategy.¹¹ This document was published over Gen Gordon R. Sullivan's signature when he was the Chief of Staff of the Army in 1993. The document is still valid. It has not been replaced and is therefore the source of guidance to the Army in procuring and implementing IT plans. The strategy has been in place long enough for us to evaluate its effectiveness in achieving its stated end state. So, despite the urge to ignore a document that was published when the Intel 386 chip was the base processor for the most current computer, it seems highly useful to assess the Army Enterprise Strategy, understanding that the essence of strategy is to build a posture that is so strong (and potentially flexible) that the organization can achieve its goals

despite unforeseeable circumstances (such as a 1GHz processor as the basis for PCs only seven years later).

The Army Enterprise Strategy focuses on identifying, supplying, and implementing the sophisticated information and other C4I technologies needed to support the Army Warfighter.¹² The document sets no deadline for implementing the strategy. There is no indication of a time frame along which this strategy is to progress. For example, is it designed to support Joint Vision 2010 or Joint Vision 2020? Indeed the Army Enterprise Strategy seems more hopeful than rigorous: It is "imperative that we use current and emerging technology to make the Warfighter more efficient."¹³

THE FOUNDATIONAL TENETS OF THE ARMY ENTERPRISE STRATEGY

A brief discussion of the basic tenets of the Army's Enterprise Strategy sheds some light on the successes and the failures in the Army developing, resourcing and evaluating an IT strategy. We will review a couple key descriptors of each tenet and place them in the context of what we see in our Army today. Three case studies will then provide more detailed illustrations of some of the challenges we continue to face. There are ten key tenets to the Army Enterprise Strategy:

Focus on the Warfighter (*Provide the Warfighter systems that meet validated needs*).

The first assumption that raises an eyebrow is the comment, "The Warfighter is a combat soldier by trade . . . not . . . a computer user."¹⁴ Young officers and soldiers entering the Army today are computer literate; totally familiar with beepers and cell phones. They have no fear of computers and technology. They are completely prepared to embrace the Army's move to digitization. An IT strategy ought to capitalize on the computer skills young soldiers are bringing into the Army. Second, the Enterprise Strategy promises systems that behave in garrison exactly as when deployed tactically.¹⁵ This implies we should see evidence today, seven years later, of C4I systems that are the same both in garrison and in the tactical environment. The case studies we will review shortly will document how far we have missed this goal.

Ensure Joint Interoperability (*Provide the Warfighter C4I systems that interoperate in Joint and Combined operations*).

Key in this tenet is the Army's ability to exchange voice, data, and imagery information effectively, in near- or real-time. Clearly tremendous progress has been made. But how do we know if we are making the kind of progress we need to be making for the amount of our investment? For example, lots of money is being spent on developing a Single Integrated Air Picture — an air picture, promulgated throughout the battlefield with each piece of symbology representing one object in the air with one, correct identification. In other

words, it ideally and accurately projects situational truth. However, the cost of procuring this capability may be prohibitive. We have not established a reliable way of determining whether 80% truth, or 90% truth, at a greatly reduced cost is worth the savings involved.

Capitalize on Space-Based Assets (*Provide the Warfighter assured access to mission essential military and commercial spaced-based systems that support the Force Projection Army across the entire operational continuum*). From reducing in-theater CSS footprints to utilizing the Global Positioning System, space, and access to it, is critical for the Army's future. No one can argue that such capabilities as the Global Positioning System have now become totally integrated into all the Army's battlefield operating systems. But nowhere in our strategy are we posturing ourselves for a potential adversary's equal access to space through commercial enterprises.

Digitize the Battlefield (*Provide the Warfighter an integrated digital information network that supports Warfighting systems and assures C2 decision-cycle superiority*). Battlefield synchronization, joint precision strike, near real-time common operational picture, point of engagement identification, and situational awareness at the lowest level are all Army Enterprise Strategy visions to be provided by means of digitization of the battlefield. We are on the verge of declaring we have a digitized division. Yet where is all the euphoria we should be sensing from the magnitude of such an accomplishment? Everyone I have talked to who has worked on the digitization experiments at Fort Hood say we still have a long way to go.

Modernize Power Projection Platforms (*Provide the Warfighter a modern power projection platform to support peacetime operations, training, mobilization, force projection, split-base operations, and redeployment*). By modernizing the IT infrastructure of our power projection platforms, the Army should realize a reduction in strategic lift requirements, enjoy uninterrupted and sustained CSS, continuous availability of CONUS services, reduced exposure of troops, and quickened entry and exit. Those are significant, measurable goals by which the Army can evaluate its IT Strategy. Yet there are no available measures of the extent to which the Army is achieving these ends.

Optimize the Information Technology Environment (*Provide the Warfighter more efficient information support for combat and peacetime operations*). This tenet talks about building modular systems that consist of existing, commercially available equipment. Commercial off-the-shelf acquisition should enable the Army to reduce acquisition costs and increase compatibility. This improvement is based upon establishing and using Army Standard Data Elements. In order to do that, the Army must reexamine basic business processes and streamline them to meet current and future mission requirements. The Army should also do

everything possible to use commercial standard data elements. These platitudes are on target. But the fact of the matter is that today we continue to have major interoperability problems, because there continues to be too much leeway in which a contractor can interpret such things as data-link message formats and the like.

Implement Multi-level Security (*Provide the Warfighter the ability to access and exchange information at needed levels of classification using a single C4I system*). Immediately we recognize that every strategy used to address the challenges of C4I system security and classification has had significant drawbacks. Requiring too high a level of trust is unacceptable. Mixed levels of trust have spawned multiple redundant systems. Therefore multi-level security is the only strategy practicable. However, we have not come very far in this matter in the last seven years. Participation in Army level-exercises requires three different local area networks: US non-secure, US secure, and coalition secure. Furthermore, a strategy for multi-level security cannot be executed while ignoring a very significant factor, foreign disclosure policy.

Ensure Spectrum Supremacy (*Provide the Warfighter electromagnetic spectrum supremacy in order to maximize the benefits of maneuver and tempo in conjunction with firepower*). The strategy focuses on spectrum supremacy. Yet, one paragraph later we read, "We cannot count on uncontested ownership of the electromagnetic spectrum in future conflicts."¹⁶ Clearly, the concept of a single point of contact for spectrum management and link control within the Joint Task Force is well on its way to fruition, with functions such as the Joint Interface Control Officer (JICO)¹⁷ now in place. However, we cannot be confident about a strategy that depends upon national, international, and allied policy formulation, which the Army has little to no control over. It also seems rather naïve to assume that military requirements will most often trump economic requirements. Just the opposite is most likely the future. Consider the Army's push to move all software into the programming language ADA. Commercial enterprises are not using ADA, so now it has become a thorn to software acquisition.

Acquire Integrated Systems using Commercial Technology (*Provide the Warfighter synchronized C4I capabilities that leverage commercial technology*). It is clear that the strategy here is highly dependent on changes to the acquisition process. Four times it mentions changes that must occur to the acquisition process to take advantage of the rapid pace of change in commercial technology: "Streamline the acquisition process." "Give the Army a strong incentive to re-address acquisition strategies." It goes on to say, "The entire acquisition [process] will adjust . . ." Further, "The Army will find ways to overcome the slowness of . . . [the] acquisition process."¹⁸ Once again, can we rely on a strategy that is dependent upon policy reform, over which the implementers of the strategy have little to no control over?

Exploit Modeling and Simulation (*Provide the Warfighter with cost effective training, testing, and rapid prototyping through state-of-the-art modeling and simulation*). The Army Enterprise Strategy highlights the numerous advantages that exploitation of modeling and simulation will garner for the Army. However, a strategy to attain those ends is not readily apparent, except for the comment that the goal "implies that standards will be applied to tactical and business systems" to seamlessly integrate modeling and simulation. There is no doubt that simulations drive virtually every exercise the Army participates in today. Simulations are also a key element in the acquisition process. However, tremendous redundancy exists throughout the multitude of simulations in use today. A lot of money is being wasted on those redundancies.

To summarize, several end states postulated in the Army's Enterprise Strategy have failed to fully materialize in the last seven years. Our young soldiers and officers are increasingly frustrated with a work environment that is, in many ways, "less high tech" than what they have at home. It is difficult to see how we have done anything but make our C4I systems more complex. Walk into any "digitized" tactical operations center and count how many contractors are walking around trying to get, and keep, all the "boxes" working. We are being asked to implement a strategy that is dependent on changes to requirements dictated by Congress (acquisition law), dependent on national and international policy changes (foreign military sales and data standards), and dependent on establishing standards that will shape the development of commercial systems as well as Army systems. The Army can no longer expect to shape commercial standards. It should be no mystery then why the Army strategy is being developed implicitly rather than explicitly. Soldiers see solutions to their problems sitting on the shelves of their local stores. Ultimately, their frustration motivates them to buy the solution, regardless of what the Army may have in mind.

THREE CASE STUDIES

Three examples anecdotally reveal the Army's failure to successfully develop, resource, and evaluate its IT strategy. These three case studies are not intended to be representative of the way things are everywhere in the Army. However, they do indicate the genuine need to review how the Army develops, resources, and evaluates its IT strategy.

CASE ONE: In a combat arms battalion today there are three systems that require company clerks to manage the same type of data. The Army Company Information System (ARCIS) is located in every company or detachment in the field Army; it performs those functions of company administration that are necessary for the management of the company.

This database software package allows the company to manage soldier-training records, such as weapons qualification and Army Physical Fitness Test scores, and personnel information. ARCIS was developed and fielded as a software system only, due to a lack of funds for hardware procurement.¹⁹ It should give us pause to think that the Army felt initially compelled to field a hardware and a software solution when only a software solution was needed. Until the Army fielded ARCIS, many enterprising young officers and soldiers would use the spreadsheet or database program resident on their computer to perform the same functions. The Standard Installation/Division Personnel System (SIDPERS) III provides the Army with a personnel management information system. SIDPERS III brought many functions historically done at the Personnel Services Battalion to the unit Personnel Administration Center (PAC). It thus brings transaction processing closer to the user and reduces data entry efforts. Included in these data items are many of the same data elements that are resident in ARCIS. But SIDPERS and ARCIS do not share those data elements electronically. SIDPERS III also moved eighty-eight functions formerly done at the local finance center to the unit PAC. At the same time, unit authorization documents are reducing the authorizations for the military occupational skill (MOS) (75B)²⁰ required to do all these functions at the PAC. The Army has been working on fielding the Combat Service Support Control System (CSSCS) module as part of the digitization effort for at least the past seven years. Like SIDPERS III and ARCIS, CSSCS tracks much of the same information yet does not talk to either system digitally. CSSCS is a tactical system not currently planned for use in garrison. Company clerks who use ARCIS to manage company personnel records must feed the same data into the SIDPERS III. A commander has no choice in the matter, because promotions and pay are impacted by those data elements. When clerks go into a tactical environment, they must populate an entirely new database existing on an entirely different type of hardware, using an entirely different software package (CSSCS).

Instead of making clerks more efficient, we have, in effect, made them less efficient and certainly less effective — as well as very frustrated. The Army is fielding hardware and software systems that are out of synchronization with each other and expecting the soldier to pick up the slack. We are paying for multiple software systems that are redundant. Contrary to the goal of “provid[ing] systems that behave in garrison exactly as when deployed tactically,” we seem to be going in the exact opposite direction. Some will say that all these systems will eventually talk to each other and thus all those problems will be solved. They don’t talk yet. They haven’t for the last several years. So why does the unfounded hope for the future justify increasing the burden on our soldiers today?

CASE TWO: Right now the Army's parts and retail supply system are made up of a kluge of subsystems. No single person is able to adequately describe, let alone control how the system functions. The Standard Army Maintenance System-1 (SAMS-1) is an automated maintenance management system used at the direct support (DS) maintenance company found in the separate brigade, division, corps, and echelons-above-corps and the general support (GS) maintenance company at echelons-above-corps. The system automates work order registration and document registers. It automates inventory control and reorder of shop and bench stock, as well as work order parts and requisitioning. SAMS-2 is used by the field commands to collect and store equipment performance and maintenance operations data. This is used to determine guidance to be given to their subordinate maintenance units. The Unit Level Logistics System — Ground (ULLS-G) is the primary system units use to manage all maintenance and parts. It automates vehicle dispatching, Prescribed Load List (PLL) management, and The Army Maintenance Management System (TAMMS). ULLS-G interfaces with the Standard Army Retail Supply System-Objective (SARSS-O), SAMS-1, In-Vehicle Information System (IVIS), vehicle sensors, and ULLS-S4. The Automatic Identification Technology (AIT) Interrogator is connected directly to the ULLS-G. ULLS-G is linked to the wholesale supply system through the Objective Supply Capability (OSC). Everything done in ULLS-G feeds into and through SAMS – 1 and SAMS – 2. There is also an ULLS – S4, which automates the supply property requisitioning/document register process, hand/sub-hand receipts, component, budget, and logistical planning activities at the Unit Supply, Battalion, and Brigade S4 levels. It also receives and produces Army Material Status System (AMSS) Reports generated by ULLS-G/A systems or by another ULLS-S4 system. The AIT Interrogator is connected directly to ULLS-S4 which interfaces with the Standard Property Book System-Revised (SPBS-R), ULLS-G and Unit Level Logistics-Aviation (ULLS-A) (for budget and AMSS data transferring), Standard Army Ammunition System (SAAS), SARSS-O at the Direct Support Level, the Standard Army Intermediate Level Logistics System Supply (SAILS), the OSC SARSS Gateway and the Combat Service Support Control Systems (CSSCS). We could go on explaining the entire system but the number of new systems introduced into the process rise exponentially. The point is: It's complicated! No one knows exactly how it all works. Commanders do not have the ability to manage and control their budgets, because there is no longer one system (like the old TUFMIS²¹ report) that can do what we use Quicken or Microsoft Money to do for us at home or at a business. Soldiers with MOS 92A²² must know how to use all these systems. At Fort Bliss, the complexity of the system caused so many problems that unit readiness suffered and training dollars were spent to bring in teams of experts to identify

and solve the problems. Current personnel shortages and turnover rates exacerbate the commander's challenge to keep trained and qualified people working these systems.

Once again, we look back to the end state of our IT strategy and ask ourselves if this is where we wanted to be. How is our current strategy going to prevent us from being in the same position seven years from now? Soldiers spend more time feeding machines these days than doing the tasks the machines were designed to simplify.

CASE THREE: While fielding the Patriot Advanced Capabilities (PAC) III system, and designing, building and testing the Battalion Tactical Operations Center (BTOC), efforts to overcome IT stumbling blocks caused the unit to unknowingly take measures which were out of harmony with the Army's overall IT strategy. While the Army was on a fast train to develop all the systems that were mentioned in the previous two cases, the battalion was on a fast train to ensure they had what they needed to fight that night if need be. The two competing requirements — the Army's IT vision for the future, and the unit's preparedness for war — were incompatible. As we built the PAC III BTOC, three principles guided our efforts. First, everything we did in garrison was to be done the same way as required by tactical operations, consistent with the goal stated in the Army Enterprise Strategy. Second, we wanted to establish ownership for each piece of data and strive to ensure that piece of data was entered into the system only once. Again, we were invoking a principle of the Army Enterprise Strategy. Third, we wanted to maximize the Staff's analysis and assessment of data and minimize the amount of time to gather the necessary data. The resources available to solve these challenges were the hardware/software applications mentioned earlier, plus the software that was resident on our PCs. To make a long story short, for all the reasons mentioned in the first two case studies and many more, we rejected the use of ARCIS in total, did only what was absolutely required in SIDPERS and the other CSS systems, and then did everything else in Microsoft Office. Within a matter of one month, the entire Battalion was automated. Staff update slides, Unit Status Report Slides, and other items were all created automatically using hyperlinks in Microsoft Office. Soldiers knew how to use and customize the applications because they already knew how to use Microsoft Office. Not only did we automate everything in the Battalion, we virtually eliminated the training associated with our applications. At first there was resistance from the branch leadership to this concept until they saw how well it worked and heard soldiers saying things like, "We do things in the field just like we do them in garrison."

This example demonstrates why Army IT strategy is implicitly developed rather than explicitly developed. A unit was crumbling under the weight of an information system that required more effort and energy than the unit had to give. Although the unit knew the future

would solve some of the problems they were struggling with every day, the soldiers still made sure that they could use what they had available to fight that night if called to deploy immediately. Units all over the Army are solving their workaday IT problems in this common-sense way. However, taking all these strategies and putting them together does not lead to a strategy that is the most beneficial to the Army.

ARMY IT STRATEGY DEVELOPMENT

How the Army develops its IT strategy is encapsulated in a document called the Army's C4I/IT Investment Strategy.²³ This document not only lays out the linkages between the Army's IT strategy and The Army Plan (TAP), it goes into great detail about how the Army decides where to put its IT dollars. The Chief of Staff of the Army, in accordance with his Transformation Vision Statement, stressed the importance of global reach-back, split base operations, and internetted Command, Control, Communications, and Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) to the Army's global mission. The C4I/IT investment strategy is intended to provide a focused approach for the Army to prioritize information technology investment solutions that will achieve these objectives.²⁴ Figure 1

Strategic Framework for Army C4I/IT Investment Strategy

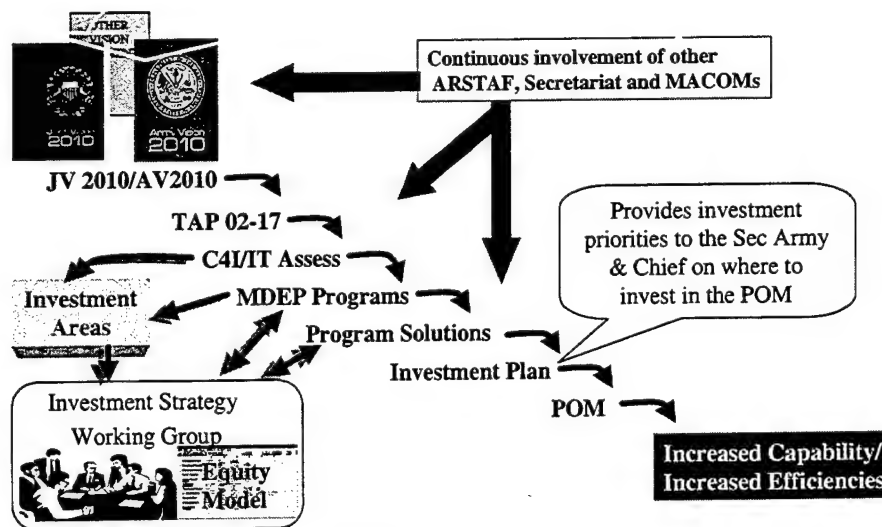


FIGURE 1: STRATEGIC FRAMEWORK

graphically displays the strategic framework within which the Army's IT strategy exists.

Although the Army Enterprise Strategy is still valid and is being updated, this graphic provides further evidence that the C4I/IT investment strategy is the Army's defacto IT strategy.

A key goal of the Army's C4I/IT strategy is to evolve from today's platform-centric force into a network-centric force in 2010 — and, finally, into the knowledge-centric force of 2025.²⁵ The strategy is designed to shape the transformation of the Army in terms of C4I/IT for the next 10 to 25 years. Another key goal of the strategy is to identify and prioritize critical C4I/IT investments that provide the most “bang for the buck” return on investment (ROI).²⁶ In that regard, the process the Army uses is dependent upon metrics that communicate value-added from IT investments. Most of these metrics are “output” oriented rather than “outcome” oriented principally because output measurements are necessary to drive measures of goodness for outcomes.

BASIC STEPS OF ARMY IT STRATEGY DEVELOPMENT

Figure 2²⁷ gives an overview of the three basic steps the Army uses in developing its C4I/IT strategy. Two themes dominate this process. First, the C4I/IT baseline strategy will provide a universal capability for warfighting operations and institutional processes. Second, specific critical capability shortfalls require additional resourcing.

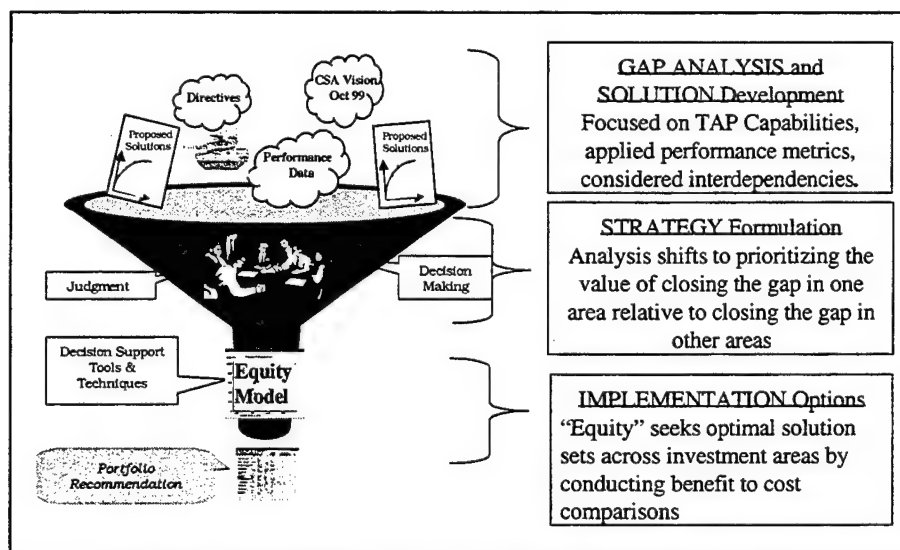


FIGURE 2: INVESTMENT STRATEGY PROCESS

The Army identified ten investment areas that were individually researched for capabilities, shortfalls, program solution possibilities and projected performance levels. A rigorous process was undertaken to review the research from each of the ten investment areas and to establish relationships between the solutions in each area to each of the other investment areas. Critical to establishing final rankings and determination of the best benefit-to-cost ratios were the consideration and valuing of the key interdependencies that exist between investment areas. Through this analysis, the Army can prioritize investment areas that have the

most significant shortfalls. The final outcome is a "package" of C4I/IT investment solutions that will provide the best return on investment.

STEP 1: GAP ANALYSIS AND SOLUTION DEVELOPMENT

The first step in the Army process is to determine what C4I/IT is supposed to do for the Army. This requires reviewing The Army Plan, specifically the Army Planning Guidance that defines the mission areas in terms of tasks and capabilities. The Army Programming Guidance Memorandum translates those capabilities into requirements to be resourced. Presumably, the Investment Area leaders are able to review and discern from the various requirements documents what is required of C4I/IT. Many platform requirement documents and even Capstone Requirement Documents assume IT will be available to meet their needs upon fielding. This analysis then feeds into an assessment to determine if the resourced requirements will provide all of the IT-related capabilities pertaining to each investment area. Figure 3 shows an example of the results of this process that ultimately identifies gaps that exist between Army mission area requirements and IT capabilities.

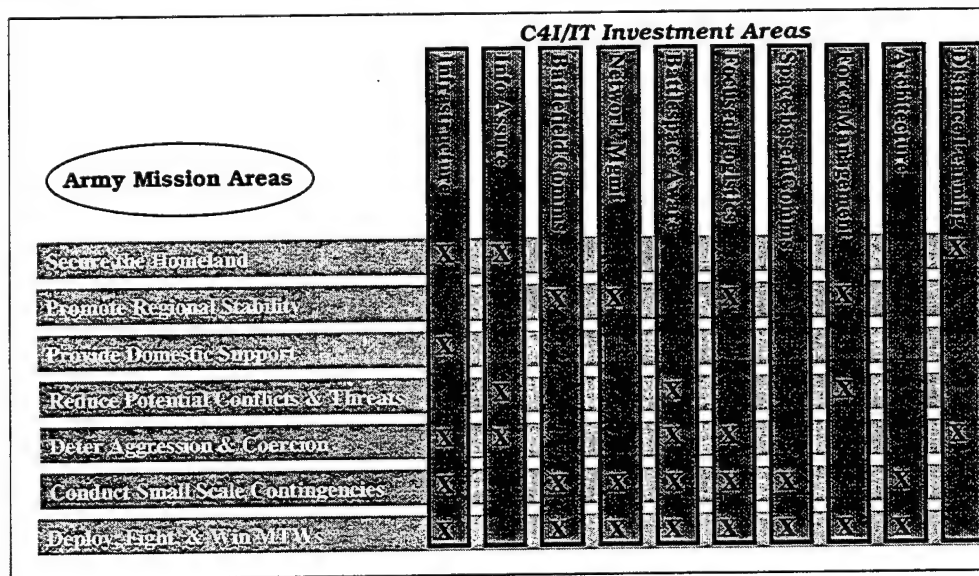


FIGURE 3: IDENTIFICATION OF SIGNIFICANT SHORTFALLS (X=GAPS)

Then each gap must be assessed. The first step in this process involves taking a first pass-through on the capabilities and culling out the C4I/IT related capabilities for each investment area leader to use in their assessment. Next, the IT Investment Area leader conducts an evaluation of each capability for gaps related to his or her investment area. The key here is for the Investment Area leaders to identify and articulate a performance measure

which shows how they could close the performance gaps if they were to receive additional funding.

An interdependency analysis is conducted as a first step in providing a first-order architectural validation to the implementation recommendations. The importance of this analysis is to promote productive discussion of the necessary relationships between programs that validated original intuitive judgments.

STEP 2: STRATEGY FORMULATION

After identifying gaps, the next step is to determine how best to close each gap. Because the Army cannot necessarily develop a strategy and expect it to be fully funded from start to finish, the Army strategy must include ways to work toward the end state, assuming funding may come in unknown amounts at unknown times. Figure 4 illustrates this reality. Due to fiscal realities, the Investment Area leaders are asked to develop and propose incremental solutions to close the gap. Each solution within the solution set is then assigned a numeric value based, in part, on an objective set of performance measures developed for that investment area and, in part, on subjective evaluation of the Investment Area leader.²⁸

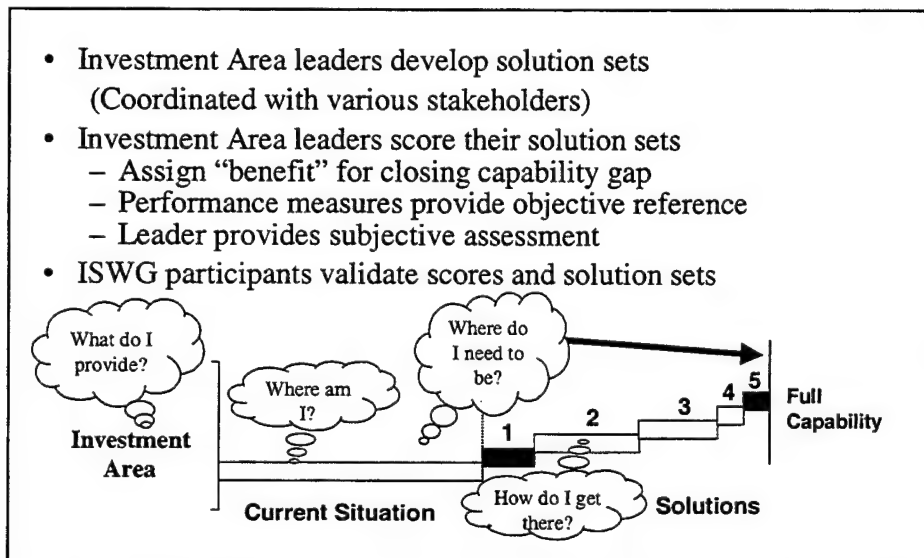


FIGURE 4: GAP ASSESSMENTS AND SOLUTION DEVELOPMENT

STEP 3: IMPLEMENTATION

The Army has started to use a decision analysis support tool to aid in resource allocation. This allocation tool is called Equity. The model uses costs and benefits to derive “best value” packages of investments, with one selection from each investment area. This resource

allocation model is a constrained optimization tool. Given cost and benefit inputs, a "best value" package of investment solutions is selected — one from each investment area. It conveys which investment choices have the highest payback, given a budget constraint, using the criterion of the benefit-to-cost ratio. Informed recommendations can be made after running enough excursions for a reasonable level of comfort.²⁹ Several operations research/systems analysis tools and processes are used to generate the input to the Equity model. These include doing pair-wise comparisons and normalization.

Three key factors are very important in this overall process: First, the information gathered by the Investment Area leaders must be thorough, complete, progressive, and substantiated by the related functional communities (logistics, personnel, operations, and intelligence) and customer communities (major commands, Reserve Component, National Guard). Second, each participant must focus and vote with a "total Army" vision and make non-parochial judgments. Third, the Army Plan capability gap assessments reflect the first order issues and can be fulfilled with measurable, desired outcomes.

C4I/IT INVESTMENT STRATEGY CHARTER

The C4I/IT investment strategy process is intended to develop C4I/IT priorities into a relevant strategic plan for the Army. Done properly, it will link strategic investment with Department of Defense and Army strategic missions and goals. The strategy should balance resources between Warfighter requirements and institutional requirements. The process is also designed to identify critical investments that provide the most "bang for the buck" return on investment. Finally, the process is designed to provide a framework for making sound programming decisions.

Familiar now with Army IT strategy development process, let us turn our attention toward the process used in the commercial world keeping in mind the two processes are designed to develop strategies to meet needs that are more similar than they are dissimilar. We have mentioned the unique challenges the Army has in implementing its strategy. However, the Army's unique needs are not a significant obstacle to sound IT strategy development.

BUSINESS IT STRATEGY DEVELOPMENT

IT strategy development is a popular subject in the business world principally because so many businesses fail to do it properly. IT organizations are collectively spending just over \$1 billion per day on simply the external procurement of IT services, exclusive of hardware costs.³⁰ That is a staggering amount! The producers of IT know and take advantage of these demands

so consumers of IT, like the Army, are at a significant disadvantage. The problem posed to the IT strategist is not how much must be spent on IT — the billions will continue to be spent — rather how to turn those expenditures into sound investments.³¹

Military professionals are taught that grand strategy is achieved through the synchronization of Ends, Ways, and Means. Strategy in the business world is a direct spin-off from military strategy. It is defined as “the pattern or plan that integrates an organization’s major goals, policies, and action sequences into a cohesive whole. A well-formulated strategy helps to marshal and allocate an organization’s resources into a unique and viable posture based on its relative internal competencies and shortcomings, anticipated changes in the environment, and contingent moves by intelligent opponents.”³² Although many corporations’ primary business is information technology, for our purposes here we are going to talk about information technology in its role as part of the business support structure and not as a product. In that regard, the vision and goals of business are similar to the vision and goals of the Army. The Army’s IT strategy and a business’ IT strategy serve to support those overarching goals.

BASIC DIMENSIONS OF STRATEGY

Common among the documents researched for this paper were four basic dimensions, natures, and designs of formal strategies. First among those dimensions are the basic elements of a strategy. That is, the goals of the strategy, which are most important; the policies of the strategy that are the most significant; and the major action sequences, or programs. Second a good strategy is built around a few key concepts, comparable to “dominant maneuver” or “precision strike” found in the Army Transformation Strategy. Businesses cite key concepts, not unlike the foundational tenets of the Army Enterprise Strategy. Third, a good strategy of a complex organization must be part of a hierarchically related, mutually supporting set of strategies. This concept is remarkably like the purpose of Commander’s Intent in achieving a desired end state. Fourth, a good strategy must not only deal with the unpredictable, but it also must deal with the unknowable. Many businesses are still wrestling with the issue of developing strategy under uncertainty.

DEVELOPING STRATEGY UNDER UNCERTAINTY

The standard business model for developing strategy is to lay out a vision of future events precise enough to be captured by means of a discounted-cash-flow analysis.³³ That model is quickly becoming passé because of the rapid rate of change in the global economy. New technologies, tools, and applications will continue to arrive at unprecedented rates, making it

virtually impossible to predictably manage technology drivers, outcomes, and especially costs. Business must learn to develop strategy under the same environmental factors that the National Military Strategy must be developed — that is an environment that is volatile, uncertain, complex, and ambiguous.

The most significant danger faced by the strategist is to adopt a binary view of uncertainty — which is to say the strategist views the world as either knowable or as completely unpredictable. As we will see shortly, this is an over-simplified view of the future. The point is that uncertainty can be assessed and understood. In that regard, analytical rigor can be brought to bear to determine levels of risk. The uncertainty that remains after the best possible analysis is designated residual uncertainty. There are four levels of residual uncertainty.

Level 1 is called a “Clear-Enough Future.” Level 1, simply stated, means that the forecast of the future is sufficiently narrow to point to a single strategic direction. Level 2 is called “Alternative Future.” The future can be described in one of a few alternative, discrete scenarios similar to the “Fortress World/Market World” scenarios presented in Allen Hammond’s Which World?: Scenarios for the 21st Century.³⁴ An example of level 2 uncertainty that is closer to home would be those decisions concerning the Army Transformation Strategy that were impacted by the recent Presidential election. Level 3 uncertainty is called “A Range of Futures.” Level 3 uncertainty is defined by a limited number of key variables, but the actual outcome may lie anywhere along a continuum bounded by that range. For example, a company may be considering introducing its product into a new market with potential customer penetration rates from 10% to 30%. There is no way to know precisely in that range what the actual rate will be, but the company’s strategy would be different if the estimate were closer to 30% rather than closer to 10%. Level 3 uncertainty is predominate for enterprises involved in technological innovation. In large measure this is the type of uncertainty the Army is exposed to in its transformation process. Decisions on what technologies to invest in, potential cost and performance attributes for the technology and the overall impact on combat operations depend on those attributes. Level 4 uncertainty, “True Ambiguity”, is characterized by multiple dimensions of uncertainty, which interact to create an environment that is virtually impossible to predict.

Tailoring strategic analysis to the four levels of uncertainty will be central to the process of developing, resourcing and evaluating an IT strategy.

CENTRALIZED VERSUS DECENTRALIZED

IT strategy development, and in particular funding strategy, is highly dependent upon whether the business is a centralized organization or decentralized. By decentralized, we mean an overall enterprise which is comprised of several subordinate business units that have significant autonomy to accomplish their unique business goals. In our military organizations, the overall enterprise would be the Department of Defense, and the subordinate business units would be each of the services. Everyone is holding on to the pipe dream of cost-effective information technology that is perfectly consistent with strategic, operational, and tactical business objectives. Unfortunately, that is not the case in most companies— the majority under-leverage IT while dramatically overspending.³⁵ The issue here is understanding who pays for what IT resources, the enterprise, the business unit, or both. If we assume that “who pays” can be determined, there must be a measurement program in place to know how much is being spent on IT, and how much the entire organization is paying.

Organizations are struggling with centralization and decentralization issues, especially the governance that surrounds them. The same struggle is occurring in the Army, although it is not recognized as such. Business units want the freedom from “incompetent and expensive” central IT organizations. Both groups want to keep costs down while developing and maintaining world class IT organizations. However, whether to use an internal IT organization or to out-source the requirements (a similar analysis is being conducted throughout the Army with the A76 process) is as much a key element in developing an IT strategy as defining the goals of the organization.

BUSINESS STRATEGY DEVELOPMENT PROCESS

A lot has been written about developing IT strategies. Although the various books, papers, and articles often use different terms, their underlying meanings are similar. That similarity extends to the words the Army uses in discussing strategy development. There are four fundamental steps in developing a business IT strategy. First, do an overall assessment of all external and internal factors. Second, choose a strategic posture. Third, develop the portfolio of actions. And fourth, actively manage the strategy.

Conduct an Assessment. For the military reader, associate this step with Intelligence Preparation of the Battlespace and its associated detailed analysis. In the business world, this evaluation can be viewed in three parts — external, internal, and uncertainty. An external evaluation includes everything that is going on external to the business. What are competitors doing? What are consumers doing? Where is technology going? What opportunities lay out

there? And, what threats are there to the business? Common analytical tools such as an industry analysis, a competitor analysis, and a societal analysis are all part of this assessment. An internal evaluation includes an analysis of what the business is doing now. Most important in understanding what the business is doing right now is an understanding of the overall goals of the business strategy that the IT strategy is supposed to support. What assumptions are embedded in the current strategy? How are they panning out? What are the strengths and capabilities inherent in the business? What risks are the business being exposed to right now? Understanding uncertainty is the last step during this assessment. As discussed earlier, if all the analysis is done completely and correctly, what remains is determination of the residual risk as defined by the four levels discussed earlier.

Choose a Strategic Posture. Given a clear understanding of the strategic goals of the enterprise and a clear understanding of the residual uncertainty that exists, one of three strategic postures must be chosen. This is rather like choosing between a strategic offense or a strategic defense. The three postures a company can choose to take vis-à-vis uncertainty are shaping, adapting, or reserving the right to play.³⁶ Fundamentally, a posture defines the intent of a strategy relative to the current and future state of an industry. Although the military is not a competitor, per se, in a particular industry, it is competing in terms of the overall effectiveness and efficiency of deterring war, or waging war and winning against all other military threats. In this regard, the military is a major investor in technology development, not just a user. In fact, military research, development, testing, and evaluation have been major catalysts of commercial technological growth and capacity. With that in mind, choosing a posture of being a shaper, an adapter, or reserving the right to play is the next most important step.

A "shaper" aims to drive its industry to a new structure of its own devising. Hewlett-Packard is trying to shape the digital photography market by investing heavily in technology that shifts photo processing from the stores to the home via low-cost photo printers.³⁷ We could argue that terrorists are shapers in that they are investing heavily in weapons of mass destruction in order to redefine the military element of power to their favor. It is risky and rare that you will find a company trying to shape an industry in level 1 uncertainty. FEDEX is a good example of making a big bet on the uncertainty of a market for overnight delivery. Because of their success, the entire industry was forced to adapt to a new structure to satisfy the demand for overnight delivery services.³⁸ In levels of uncertainty 2-4, "shapers" are trying to reduce the level of uncertainty by moving the market in certain directions.

"Adapters" assume the current industry structure and its future evolution as givens and then they prepare to react promptly to the opportunities the market offers. In industries with little

uncertainty, adapters try to position themselves in certain places in the industry. Under higher levels of uncertainty, adapters try to position themselves so they can react quickly to changes in the industry and quickly developing markets. The telecommunications-service industry, for example, focuses on posturing itself to resell the latest and greatest technology as it is introduced.

The third strategic posture, "reserving the right to play," is rather like adapting, but only applies to levels of risk 2-4. A company choosing this posture makes small investments in several promising technologies and then waits to see what happens before deciding upon which to capitalize. The Ballistic Missile Defense Organization has made billions of dollars of investments over the years in promising technologies to counter the ballistic missile threat, hoping one or more of those technologies will ultimately provide a solution.

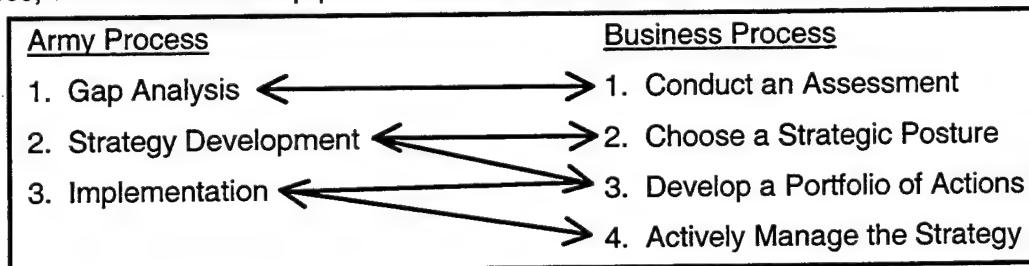
Develop a Portfolio of Actions. There are three types of moves that a company can make in implementing a strategy under uncertainty. First are big bets or large commitments, capital investments, or acquisitions that will result in large payoffs in some scenarios and huge losses in others. Shaping strategies usually involve big bets whereas the other two strategies do not. Although a bit simplified, the Star Wars program was an example of a big bet in that the huge monetary investment would bring the Soviet Union to its knees financially. Under another scenario, it would nullify the effectiveness of our own nuclear deterrence should the Soviets succeed in their own missile defense program. Second, options are designed to secure the big payoffs under the best-case scenarios, while minimizing the losses under the worst-case scenarios. The military's investment in the Civil Reserve Air Fleet is an example of an option which mitigates the risk of a large scale mobilization by making small investments in civilian air for the future benefit of having the necessary airlift when needed, without risking the potential capital loss of investing huge sums in procuring more military airlift and never needing it. No-regrets actions are just as the name implies. They are actions that can be taken that promise some pay-off no matter what happens in the future. Deciding to digitize the Army can be considered a no-regret decision. At the heart of the traditional approach to strategy lies the assumption that by applying a set of powerful analytic tools, executives can predict the future of any business accurately enough to allow them to choose a clear strategic direction. As we have seen, the more volatile, uncertain, complex, and ambiguous the environment, the more the traditional approach breaks down and new methods of developing strategy based on uncertainty are required.

Actively Manage the Strategy. The last step to developing a strategy is to ensure that processes are put into place to actively manage the strategy. Once the strategy is developed, it

is not going to run on autopilot. The right kinds of metrics are critical to know if the strategy is moving the business toward its goals. Two categories of metrics are important here: identifying a few key performance metrics for the services that are to be provided, and identifying key cost metrics for each service.³⁹ Metrics are also critical in monitoring trigger events that may prompt taking an adaptive posture to know when to move in a particular direction. Short cycle reviews must be established to ensure that all options are continuously reevaluated. Active management is the key to reducing the factors that raise uncertainty. Getting the right people involved in developing and implementing the strategy goes a long way to achieving the necessary buy-in so critical to making a strategy successful. Businesses that do all other steps right in developing their strategy may still experience great difficulties if they fail to involve the right people. Those "right people" must be strong leaders who are capable of managing change. The message here is that management must have the right kind of metrics established to understand if dollars invested in IT are, in fact, improving output and/or outcome. For example, a metric which identifies all the data elements required of the IT service and identifies multiple examples of the same data element existing in different formats (or in multiple databases) may provide insight concerning the progress being made toward data standardization and actually reducing the amount of data input required by soldiers. If an IT service is fielded and actually increases those metrics, then something has gone awry.

PROCESS ANALYSIS

At the aggregate level, the process the Army uses to develop an IT strategy is very similar to the way an IT strategy is developed in the business world. The Army has a three-step process, whereas a four-step process is used in business. They are correlated below:



SIMILARITIES

Although the terminology can be quite different and some of the organizational structures and processes may not directly translate from the Army to a corporate structure, both processes are designed to synchronize Ends, Ways, and Means to promote the interests of their respective organizations. Both processes are designed to get the most value for the money

spent on IT with the motive of making it an investment, not just an expenditure. Both processes are linked directly back to the grand strategy of their parent organization. In the Army's case, this is The Army Plan; in the business process it is the corporate business plan. Both processes attempt to minimize the negative factors caused by stresses within the organization. For the Army, such factors include the competing requirements across major commands or staff agencies. In the business world such factors include the interaction between the corporation and the business units.

Both processes incorporate to some degree metrics designed to show the value added of IT expenditures. Both the IT professionals within the Army and those within a business must compete for dollars to advance their strategy and achieve their desired end state. In terms of funding that is probably the only similarity. We have noted that Army IT professionals must compete every year for dollars, while business IT professionals tend to compete to fund entire projects, start to finish.

DIFFERENCES

Step one in both processes boils down to assessment. However, the nature and conduct of that assessment is different in a variety of ways. First and foremost is the direct linkage to the overall business plan — in the Army's case to The Army Plan. The Army's IT strategy must conform to the timeframe necessary to support the services identified in The Army Plan. However, as we have seen, the Army's strategy development process is really focused on the timelines established for the FYDP. The myriad of subordinate programs are uncoordinated because the strategy does not remain focused on a specific end state in a desired timeframe. As we have seen in the first two case studies, multiple systems were fielded out of synchronization with each other. That in turn causes redundancy and interoperability problems.

The Army needs to find new ways it can ensure organizational compliance with its strategy without snuffing out organizational energy. The business strategy process goes through an internal evaluation every bit as thoroughly as an external evaluation. Organizational structure is an essential consideration before establishing the right kind of governance necessary to ensure centralized control for the maximum benefit of the entire organization, but decentralized execution enables business units to focus on their particular sets of circumstances and requirements. It is not clear in the Army who is responsible for what aspects of IT. Business suffers from comparable issues of responsibility and accountability. This, inevitably, causes the implicit strategy development talked about earlier, instead of the desired explicit strategy development. A good example of dealing with this problem is the development

of an operational architecture. Every "system" is supposed to have one, but few have such serious, overall design. An operational architecture identifies every node, task, product, constraint, resource, and data element in a process. The Joint Theater Air and Missile Defense Organization is in the process of developing an operational architecture for TAMd.

A further example of internal evaluation necessary during the assessment step is the Army's acquisition system. The Army cannot build an IT strategy on the back of an acquisition system that takes longer to complete a cycle than it does for the next generation computer to come out. As mentioned in the Army Enterprise Strategy, but not mentioned at all in the C4I/IT Investment Strategy, the acquisition process in the military is wholly incapable of responding to an environment of such rapid change. With technology turning over every 18 months, an organization as large as the Army cannot expect to take advantage of technology without developing policies that allow for more rapid acquisition. The Army itself can change the majority of policies and regulations that encumber the acquisition process. Pointing to Congress to change acquisition law is passing the buck. Those building the Army's IT strategy should review internal policies to improve the acquisition process, working all the while to win the case of changing policies they do not control. Better control over the acquisition process would give the Army much better control over when IT services are fielded and avoid the complex kluge of systems discussed in case study two.

As stated earlier, the Army process has become completely entangled in budgetary constraints and requirements, whereas the business process is focused on understanding uncertainty in the future and establishing the right posture and sets of actions to move forward. The Army, in the midst of transformation to weapons systems not yet defined that will communicate and interact in an unknown manner, does not address the uncertainty of the future to determine how best to invest to ensure Army IT is postured to meet future requirements. Should IT programs try to shape the future, posture themselves to adapt to it, or invest in a wait and see strategy? Managing change, functioning effectively within a volatile, uncertain, complex, and ambiguous world are all the buzzwords of strategy development. The Army process must focus on really understanding uncertainty, not dismissing it in a VUCA acronym.

The Army is not measuring performance of its strategy against its end state. Rather, it ineffectively focuses its organizational leadership on measuring the progress of processes. Metrics are absolutely critical to the development of a business IT strategy. The Army process is focused on developing metrics that show the value of given investments. While the business process must do the same to sell their strategy to management, they want to see proof of cost effectiveness upon implementation. An IT strategy succeeds when it really does improve

processes, reduce operating costs, improve morale, and make personnel more efficient and effective. The Army process does not get down to this level of detail. The contractor is required to provide hardware or software products that meet certain operational requirements as laid out in a document. The Army needs metrics measuring the difference between what performance we thought we were buying and that which we are actually receiving. Success is not defined in accordance with the "first unit equipped" date.

REFLECTIONS AND CONCLUSIONS

The Army has not realized its IT strategy end state. Changes must be made in how it develops, resources, and evaluates an IT strategy. The Army can profit from looking at the process that businesses use to develop their IT strategy. The budgetary process the military must endure every year is quite inefficient and fraught with distractions that often have little to do with finding the best solution for the Army. This disturbing reality won't change any time soon. Advocates of strategic planning often urge managers to plan for perpetual instability in the environment (for example, by rolling over five-year plans annually). But this obsession with change is itself dysfunctional. Organizations that reassess their strategies annually will drive themselves to inaction. The formal planning process repeats itself so often and so mechanically that it desensitizes the organization to real change.⁴⁰ Therefore, a strategy development process that appears to focus too heavily on the budgetary process and spends too little effort in finding the right ways to posture the Army for 2010, will fail.

The Army Enterprise Strategy was promulgated seven years ago, and we have seen evidence that it failed to achieve its desired end state in some significant ways. The C4I/IT Investment Strategy was carefully crafted to establish that all-important linkage between IT programs and Army goals. It may be effective in justifying certain resource requirements. However, it is hard to imagine we will not be having the same discussion ten years from now.

If the Army had developed an IT strategy more in line with the business IT strategy development process the three case studies mentioned earlier would have a different ending. It seems reasonable to expect that, had the Army conducted a more detailed assessment (looked hard internally, considered organizational structures, governance, what levels (business units) should have the authority to establish their own IT structures) the Army may have found several ways to improve processes, budgetary issues notwithstanding. Instead, the Army focused on building a strategy that gets to a desired end state at a declared time. Senior Army leaders are taught the importance of understanding a future fraught with uncertainty. Selecting an appropriate strategic posture and set of actions and accounting for uncertainty would result in

hardware and/or software systems being fielded when they will improve life for the soldier, not just when they are finally ready. If the Army spent some more effort in developing metrics which measure the actual improvements systems are thought to bring to the Army, soldiers wouldn't be entering the same data into three different computers or having to spend dollars meant to buy ammunition to have a contractor determine why their system is not working.

With each new leap in technology, the potential exists for an adversary (whether economic, political, or military) to seize the initiative and pose a significant threat. The ability of an adversary to identify, develop, and implement a threat to the United States very quickly is increasing. That is because the threat is increasingly more asymmetric. We are increasingly more vulnerable due to our growing dependence on IT. Positioning an enterprise to be a leader ten, twenty, or more years from now using technology that may not even exist today will not happen by accident. It will require leadership, vision, and a strategy that can take advantage of a future that cannot be defined with certainty. It will take leaders who are not in such a hurry to meet the future that they forget we must survive today.

11,973 WORDS

ENDNOTES

¹ Hans Morvec, ROBOT, (New York: Oxford University Press, 1999), 68.

² For example, in 1995 we purchased several HP 750 computers for the Tactical Operations Center we were building. They cost approximately \$20,000 apiece. The militarized version of the same computer cost \$75,000 apiece. In five years of working closely with this and other hardware, reliability was not noticeably different between the two models. An optical disk drive to perform backup data recording in the Patriot system costs \$60,000. They are being replaced now with a Jazz Drive that costs \$200. When one fails, the unit can go to their local computer store and get a replacement.

³ David P. Masko, "Desert Storm Weapons," Air Force Times, available from http://www.af.mil/news/Mar1996/n19960325_960270.html; Internet; accessed on 14 March 2001, 1.

⁴ J. B. Quinn, Strategies for Change: Logical Incrementalism, (Homewood, Ill.: Richard D. Irwin, 1980), 35.

⁵ Henry Mintzberg and James Brian Quinn, The Strategy Process: Concepts and Contexts, (Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1992), 12-16.

⁶ Ibid, 12-16.

⁷ MG Richard A. Chilcoat, "Strategic Art: The New Discipline for 21st Century Leaders," (reprinted by permission, Carlisle Barracks: U.S. Army War College, Course 1, Volume 1), 43.

⁸ U.S. Department of the Army, Army DISC4'S C4I/IT Investment Strategy Results and Processes: POM FY 02-07 Recommendations, (Washington, D.C.: U.S. Department of the Army, March 2000), 7.

⁹ Henry Mintzberg and James Brian Quinn, 10.

¹⁰ Michael E Porter, Competitive Strategy: Techniques for Analyzing Industries and Competitors. (London: Collier Macmillan Publishers, 1980), xiii.

¹¹ U.S. Department of the Army, Army Enterprise Strategy: The Vision, (Washington, D.C.: U.S. Department of the Army, 20 July 1993).

¹² Ibid, 4.

¹³ Ibid, 8.

¹⁴ Ibid, 11.

¹⁵ Ibid, 12.

¹⁶ Ibid, 27.

¹⁷ The Joint Interface Control Officer (JICO) is responsible for managing the Tactical Digital Information Links (TADILs) and the overall joint interface. The Area Air Defense Commander designates the JICO.

¹⁸ Ibid, 28-29.

¹⁹ CASCOM Information Systems Directorate, Army Company Information System; available from http://www.cascom.army.mil/automation/Automated_Systems/Initatives/arcis; Internet; accessed 26 December 2000.

²⁰ The military occupational skill (MOS) of 75B works in the personnel administration center of a Battalion and higher headquarters. This person is responsible for handling all personnel related actions and inputs all the data into the SIDPERS III system.

²¹ The Tactical Unit Financial Management Information System (TUFMIS) was the first system used to manage financial transactions at the major Army command (MACOM) level and below. Unit commanders would receive a monthly report, which neatly summarized all the transactions conducted by that unit each month. The report also gave the commander an accurate accounting of his budget so he knew exactly how much money he had remaining.

²² MOS 92A are supply and repair part inventory control specialist responsible for ordering, receiving, turning in, stocking, and inventorying all supplies and repair parts for a unit.

²³ U.S. Department of the Army, Army DISC4'S C4I/IT Investment Strategy Results and Processes: POM FY 02-07 Recommendations.

²⁴ Ibid, 1.

²⁵ Ibid, 2.

²⁶ Ibid, 2.

²⁷ Ibid, 5.

²⁸ Ibid, 25.

²⁹ Ibid, 25.

³⁰ Steve Andriole, "Funding Strategy -- Paying For Strategic And Tactical IT", available from <http://www.cutter.com/consortium/index.shtml>; Internet; accessed on 6 November 2000, 1.

³¹ Steve Andriole, 2.

³² Henry Mintzberg and James Brian Quinn, 5.

³³ Hugh Courtney, Jane Kirkland, and Patrick Viguerie, "Strategy Under Uncertainty," Harvard Business Review, (November-December 1997): 2.

³⁴ Allen Hammond, Which World?: Scenarios for the 21st Century, (Washington, DC: Island Press/Shearwater Books, Copyright © 1998 by World Resources Institute).

³⁵ Steve Andriole, 1.

³⁶ Hugh Courtney, Jane Kirkland, and Patrick Viguerie, 7.

³⁷ Ibid, 7.

³⁸ Ibid, 9.

³⁹ Cisco Systems, Inc., "Successful Implementation Strategies for Service-level Management," available from http://www.cisco.com/warp/public/cc/pd/wr2k/svmnso/tech/suist_wp.pdf; Internet; accessed on 6 November 2000.

⁴⁰ Henry Mintzberg and James Brian Quinn, 112.

BIBLIOGRAPHY

- Martin, James and Joe Leben. Strategic Information Planning Methodologies. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1989.
- Porter, Michael E. Competitive Strategy: Techniques for Analyzing Industries and Competitors. London: Collier Macmillan Publishers, 1980.
- Mintzberg, Henry and James Brian Quinn. The Strategy Process: Concepts and Contexts. Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1992.
- U.S. Department of the Army. Army Enterprise Strategy: The Vision. Washington, D.C.: U.S. Department of the Army, 20 July 1993.
- Boar, Bernard H. The Art of Strategic Planning for Information Technology. New York: John Wiley & Sons, Inc., 1993.
- Hamel, Gary. The Search for Strategy, Strategos. London Business School, 1997.
- Mintzberg, Henry. The Rise and Fall of Strategic Planning. New York: The Free Press, 1994.
- Porter, Michael E. "What is Strategy?" Harvard Business Review, November-December 1996.
- U.S. Department of the Army. Information Technology Architecture Efforts. Available from http://www.army.mil/disc4/majorprojects/Architecture_efforts.html. Internet. Accessed 6 November 2000.
- Meta Group Research. "Operational Process Innovation: Part 2 – Employing the Right Approach." Available from <http://www.metagroup.com/cgi-bin/inetcgi/search/displayArticle.jsp?fileName=sd875>. Internet. Accessed on 6 November 2000.
- Cisco Systems, Inc. "Successful Implementation Strategies for Service-level Management." Available from http://www.cisco.com/warp/public/cc/pd/wr2k/svmnso/tech/suist_wp.pdf. Internet. Accessed on 6 November 2000.
- U.S. Department of the Army. Army DISC4'S C4I/IT Investment Strategy Results and Processes: POM FY 02-07 Recommendations. Washington, D.C.: U.S. Department of the Army, March 2000.
- Mc Indoo, Philip L. Implementing Network Centric Systems: Lessons Learned from E-Commerce. The MITRE Corporation, Eatontown New Jersey, November 2000.
- Andriole, Steve. "Funding Strategy -- Paying For Strategic And Tactical IT." Available from <http://www.cutter.com/consortium/index.shtml>. Internet. Accessed on 6 November 2000.
- Morvec, Hans. ROBOT. New York: Oxford University Press, 1999.
- CASCOM Information Systems Directorate. Army Company Information System. Available from http://www.cascom.army.mil/automation/Automated_Systems/Initatives/arcis. Internet. Accessed 26 December 2000.

Courtney, Hugh, Jane Kirkland, and Patrick Viguerie, Michael E. "Strategy Under Uncertainty." Harvard Business Review, November-December 1997.

Hammond, Allen. Which World?: Scenarios for the 21st Century. Washington, DC: Island Press/Shearwater Books. Copyright © 1998 by World Resources Institute.

Quinn, J. B. Strategies for Change: Logical Incrementalism. Homewood, Ill.: Richard D. Irwin, 1980.

Chilcoat, MG Richard A. "Strategic Art: The New Discipline for 21st Century Leaders" Reprinted by permission, Carlisle Barracks: U.S. Army War College, Course 1, Volume 1.

Masko, David P. "Desert Storm Weapons" Air Force Times, Available from http://www.af.mil/news/Mar1996/n19960325_960270.html. Internet. Accessed on 14 March 2001.